CONON PTY LTD
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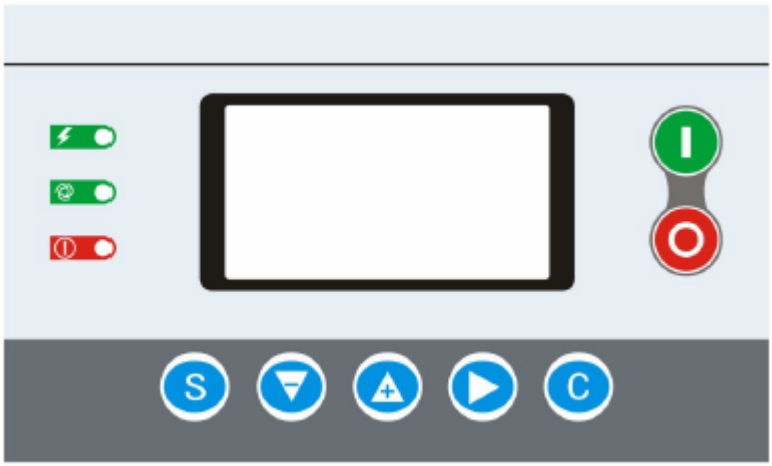
User Manual for Microcomputer Controller



CONON PTY LTD

Dear users:

Thank you for using screw air compressor controller

All our products have been strictly inspected and tested before factory delivery. However, to ensure the safe, before reliable and durable operation of the machine, please read through the Manual in details to fully master the operation specifications of the screw air compressor unit and keep the equipment in a good operating state for a long time.

The clauses in the Manual are applicable to our compressors.

Users shall learn about and abide by relevant local laws and regulations about installation and using of compressors.

If there is any difference between the clauses in the Manual and relevant local laws and regulations (especially in terms of safety), the safer clauses shall prevail.

Operators are obliged to make sure that the machine is operating under safe conditions. If it is believed that there is any potential hazard, it is necessary to timely check and repair.You will enjoy our top-class after-sales services after you bought our product. To facilitate your contact, our company's address and telephone are as follows:

CONON MOTOR
Address: No. 28 Aristoc Rd, Glen Waverley. Vic. 3150
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⚠ Precautions for use

⚠ Please read all the operation manual before operating the set

⚠ Only specialized technicians shall be allowed to install controller.

⚠ Installation position shall be considered carefully in order to ensure good ventilation and reduce electromagnetic interference.

⚠ Wiring shall be performed respectively according to regulations for heavy and weak current to reduce electromagnetic interference.

⚠ The AC contactor and electromagnetic valve controlled by relay output must be connected to surge absorber.

⚠ Carefully check the input/output wiring before supplying power.

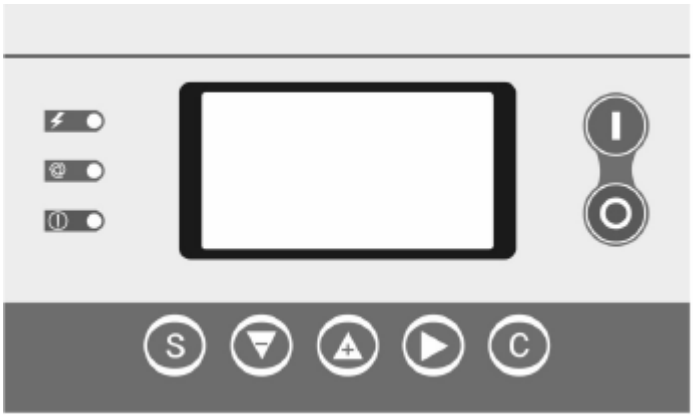
⚠ Correct ground connection of ground terminals of the machine (the third ground) can improve interference resistance of the product.

Feature:

1. Apply customized controller system to control and improve reliability of electrical control of the equipment.
2. Dynamically reflect real-time parameters, faults, performances and others of the equipment.
3. The system can facilitate online upgrading, which has greatly shortened the maintenance and commissioning time.
4. Able to customize special system procedures based on users' requirements.
5. Able to update the system and connect to the company's DCS network based on users' demands.
6. Apply variable frequency to adjust automatic output and eradicate voltage fluctuation.
7. Adjust output frequency based on users' gas consumption to save energy to the greatest extent.
8. Adapt to fluctuation of power grid, and automatically check and protect motor equipment safety.
9. Timed control, independent networking, dynamic adjustment and other modules contained inside to meet different customers' demands.

Contents

I. Basic operation



1.1 Description of the button

--Start button

- When the compressor is at stand-by state, press this button to start the compressor.
- If the compressor is in failure status, press this button to open corresponding fault page to determine specific fault

--Stop button

- When the compressor is at running status, press this button to stop the compressor; ^Shutdown system

--Move up button

- In the state of parameter setting, this button is pressed to add numerical value
- In the state of non-parameter setting, this button shall be used based on the specific functions on the LCD panel

--Move down button

- In the state of parameter setting, this button is pressed to reduce numerical value
- In the state of non-parameter setting, this button shall be used based on the specific functions on the LCD panel

--Move right button

- In the state of parameter setting, this button is used to move set data rightwards
- In the state of non-parameter setting, this button shall be used based on the specific functions on the LCD panel

--Set button

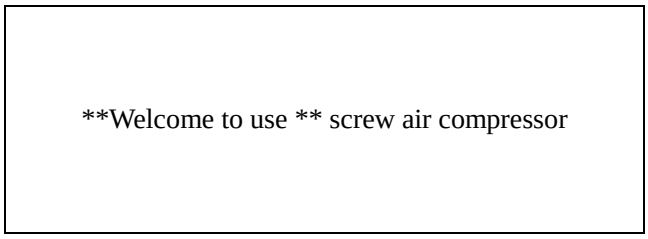
- If any settable data on the page is not in the state of setting, this button is pressed to start the function of data setting. If it is in the state of setting, this button is pressed to stop the current state of parameter setting, and switch to the setting state for the next parameter
- In the state of non-parameter setting, this button shall be used based on the specific functions on the LCD panel

--Return button

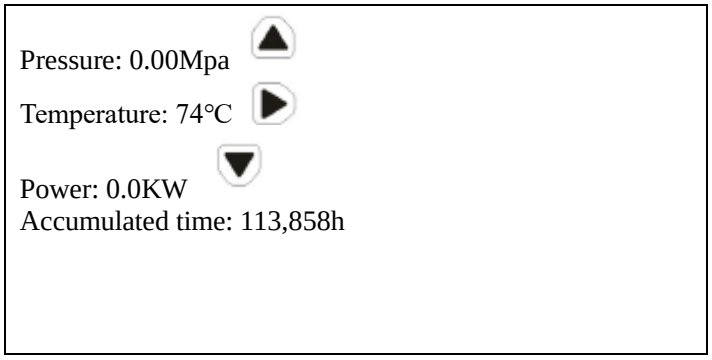
- If it is in the state of setting, this button is pressed to exit from the state of setting, without saving the parameters
- In the state of non-parameter setting, this button shall be used based on the specific functions on the LCD panel

1.2 Status display and operation

The controller display screen will show as below after power on and display:

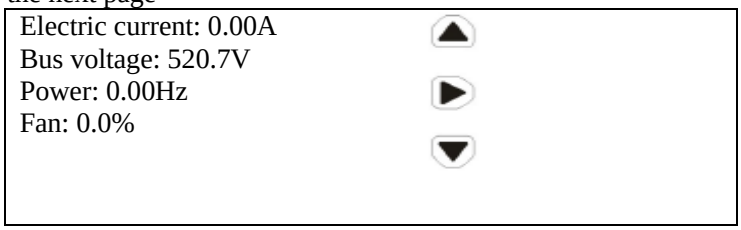


After 5s, screen of the machine automatically skip to the monitoring page after frequency conversion



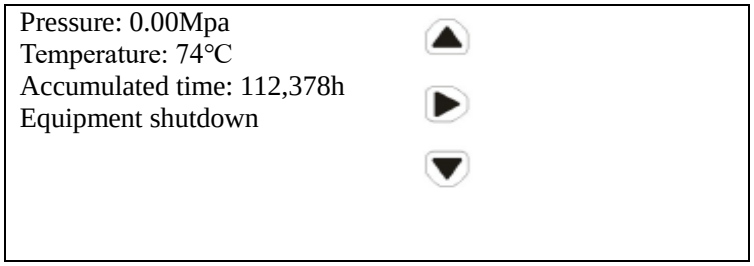
VSD Compressor monitoring-page

Press ▼ to turn to the next page



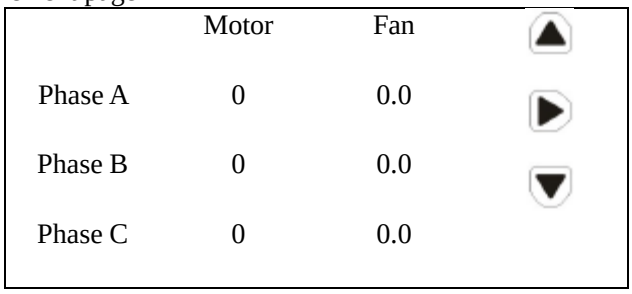
VSD Compressor monitoring-the second page

After 5s, screen of the machine automatically skip to the monitoring page after fixed speed compressor



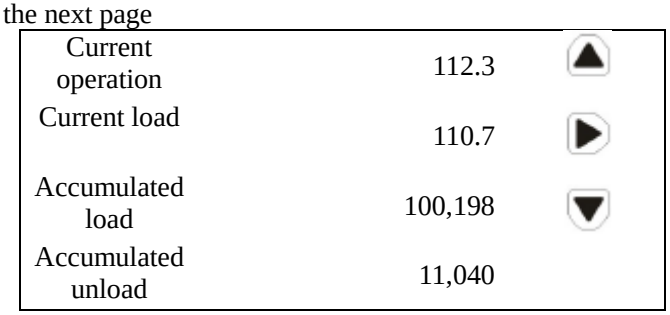
Fixed speed compressor monitoring-page

Press ▼ to turn to the next page



Fixed speed compressor monitoring-the second page

Press ▼ to turn to the next page

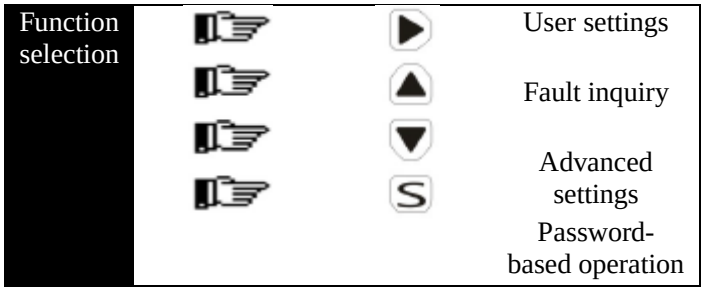


Fixed speed compressor monitoring-the three page

Notes: For the fixed speed compressor, the switching button can be pressed S monitoring page to switch the function of loading and unloading

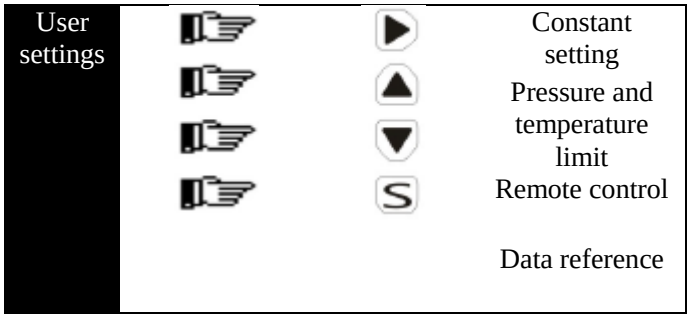
User parameters

In the state of monitoring display, press ▶ button to return to the "main menu" as shown in the following figure



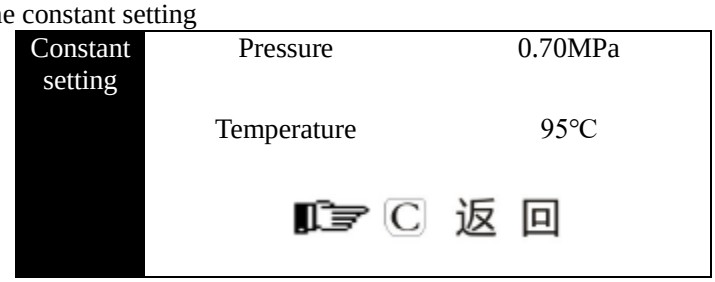
Menu page

Press ▶ to enter the user setting



Setting page for frequency conversion users

Press ▶ to enter the constant setting



Constant setting

Setting of constant pressure value

- Press S button to enter the setting state and switching position and save last set value
- Press C button to cancel the parameter setting address and skip out the setting state
- Press S button to display the upper limit for pressure set value, and the figure in the first digit flash

At this time, press ▲ or ▼ button to change the set value in the first digit of the constant pressure value and set an appropriate figure;

- Press button to display the upper limit for pressure set value, and the figure in the second digit flash

A this time, press ▲ or ▼ button to increase or decrease the set value in the second digit of the constant pressure value and set an appropriate figure;

- Press ▶ button to display the upper limit for pressure set value, and the figure in the third digit flash

A this time, press ▲ or ▼ button to increase or decrease the set value in the third digit of the constant pressure value and set an appropriate figure;

- Press S button again to save the setting parameters and skip the setting state to the lower limit for pressure. Refer to the above process for the setting mode
- Press C to exit the setting state after setting.

Parameter specifications for VSD Compressor users

Constant setting-------pressure	Constant pressure value of the system
Constant setting ------ Temperature	The desired exhaust temperature of the system, used for frequency conversion fans.
Pressure and temperature limit-------upper pressure	When the system pressure is larger than or equal to the set value, close the air intake valve
Pressure and temperature limit-------below pressure	When the system pressure is less than or equal to the set value, open the air intake valve
Pressure and temperature limit-------upper temperature	If the system temperature is higher than or equal to the set value, turn on the cooling fan
Pressure and temperature limit-------below temperature	If the system temperature is lower than or equal to the set value, turn off the cooling fan
Communication setting------- station number	It is used as location of slave machine setting during remote communication, and responds only when the main machine inquires the preset values
Communication setting------- baud rate	This set values of the same bus have to be the same
Communication setting------- communication format	This set values of the same bus have to be the same
Communication setting------- response delay	Generally, it is not modified, and shall be set if there are certain requirements for response speed for buses of different length)

Communication setting------- main machine, slave machine and invalid	(For selection of remote control, select the main machine to control 6 sets of slave machines at most, which are controlled by the main machine, will not be connected to joint control if they are invalid and will not respond to any command)

Communication setting----------upper limit for joint control	Set the main machine effective, and when the system pressure is larger than the set value, turn off one of the operating slave machines
Communication setting----------lower limit for joint control	Set the main machine effective, and when the system pressure is less than the set value, turn on one of the operating slave machines without fault
Communication setting----------order delay	Set the main machine effective, and the minimum interval time of the same command for two times
Communication setting----------switching time	Set the main machine effective, and if the difference between the longest operating time and the shortest shutdown time is larger than the set value, switch states of the two sets
Communication setting----------number of slave machines	Set the main machine as effective and number of slave machines connected to joint control, and pay attention that location of slave station has to be set in sequence after No.1
Communication setting----------remote terminal	Controller contains remote control terminals, able to choose whether to start the function. Terminal 1 and 4 activate edge signals after being started

Parameter specifications for fixed speed compressor users

Pressure and temperature limit------upper pressure	When the system pressure is larger than or equal to the set value, close the air intake valve
Pressure and temperature limit------below pressure	When the system pressure is less than or equal to the set value, open the air intake valve
Pressure and temperature limit------upper temperature	If the system temperature is higher than or equal to the set value, turn on the cooling fan
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Communication setting----------order delay	Set the main machine effective, and the minimum interval time of the same command for two times
Communication setting----	Set the main machine effective, and if the difference between the

---switching time	longest operating time and the shortest shutdown time is larger than the set value, switch states of the two sets
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Communication setting----------number of slave machines	Set the main machine as effective and number of slave machines connected to joint control, and pay attention that location of slave station has to be set in sequence after No.1
Communication setting----------remote terminal	Controller contains remote control terminals, able to choose whether to start the function. Terminal 1 and 4 activate edge signals after being started

Advanced parameter specifications for VSD Compressor users

Frequency conversion of the main machine----------upper limit	The maximum frequency during operation of the main vertier
Frequency conversion of the main machine----------below limit	The minimum frequency during operation of the main vertier
Frequency conversion of the main machine----------automatic	After selection is effective, the uplink frequency changes with the current pressure to ensure the maximum air output of the system at the appropriate pressure
Frequency conversion of the main machine----------P value	PID value in the main machine. The higher the value is, the faster the response will be. Please apply fine adjustment. Do not adjust too quickly to avoid fluctuation
Frequency conversion of the main machine--I value	I value in the PID parameters of the main machine can be slightly adjusted. Do not adjust too quickly to avoid fluctuation
Frequency conversion of the main machine----------D value	D value in the PID parameters of the main machine is not used generally
Frequency conversion of the fan-------upper limit	The maximum frequency during operation of the fan vertier
Frequency conversion of the fan-------below limit	The minimum frequency during operation of the fan vertier
Frequency conversion of the fan-------P value	P value in the PID parameters of the fan. The higher the value is, the faster the response will be. Please apply fine adjustment. Do not adjust too quickly to avoid fluctuation
Frequency conversion of the fan-------I value	I value in the PID parameters of the fan can be finely adjusted, and sharp adjustment can easily cause fluctuation
Frequency conversion of the fan-------D value	D value in the PID parameters of the fan is not used generally
Limiting parameter----------pressure	Control the maximum pressure of users and set within an appropriate scope. It can realize protection. When the exhaust pressure is larger than or equal to the set value, the system shuts down for protection
Limiting parameter----------temperature	When the exhaust temperature is larger than or equal to the set value, the system shuts down for protection
Enclosure ventilation--interval time	If the fan has not been operated for the pre-set time, start the fan forcibly
Enclosure ventilation----------execution time	Forcibly start operation seconds of the fan
Maintenance period----------current value	It will add up after the system is operated. When the current value is larger than the set value, remind users to timely maintain
Maintenance period----------set value	Able to set an appropriate value based on demands

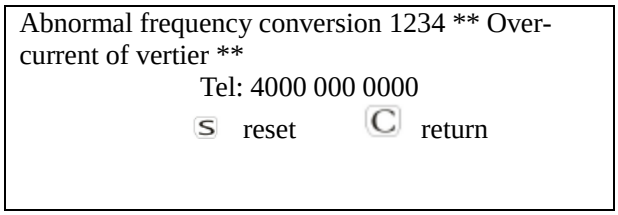
Instruction to senior parameters of fixed speed models

Limiting parameter-------ultimate pressure	Control the maximum pressure of users and set within an appropriate scope. It can realize protection. When the exhaust pressure is larger than or equal to the set value, the system shuts down for protection
Limiting parameter--limiting temperature	When the exhaust temperature is larger than or equal to the set value, the system shuts down for protection
Limiting parameter--warning temperature	When the exhaust temperature is larger than or equal to the set value, the early warning system will give alarm
Time setting--star delta	The set value is for star delta switching time
Time setting--start loading	Load air intake valves after completing the star delta and delaying

	the set value
Time setting--idle shutdown	When pressure fails to reach the lower limit within the time period, the equipment stops and waits to re-start after reaching the lower pressure limit
Time setting--shutdown protection	Equipment cannot be re-started within the time period
Time setting--stop unloading	Firstly unload and delay the pre-set time and then stop operation after the equipment stops
Time setting--start neglecting	Start protection inspection after delaying due to the large current just after the equipment is started
Maintenance period------- current value	It will add up after the system is operated. When the current value is larger than the set value, remind users to timely maintain
Maintenance period------- set value	Able to set an appropriate value based on demands

1.3 Fault display

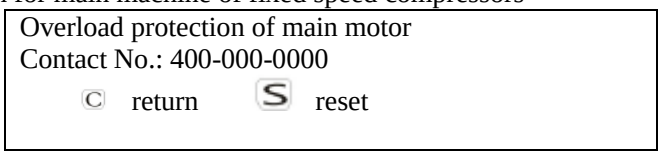
Faults of vertiers for VSD Compressors



Turn off the main switch and make sure that the machine cannot be automatically started

- Please find out failed points based on fault reasons
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

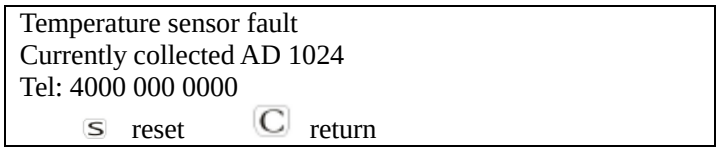
Overload protection for main machine of fixed speed compressors



Turn off the main switch and make sure that the machine cannot be automatically started

- Please check whether the main machine is jammed
- Please check whether the main motor works normally
- Please check whether power supply of contactor of the main motor works normally
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

Temperature fault

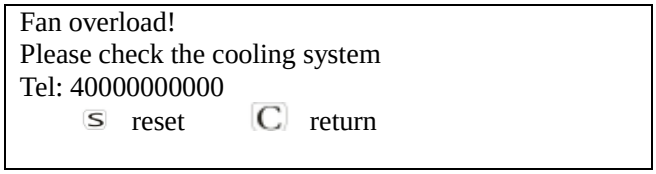


Turn off the main switch and make sure that the machine cannot be automatically started.

- Open the ventilation valve to deflate the air compressor.
- Wait for many minutes until the engine oil falling gets stable and there is no accumulated pressure inside.

- Open enclosures on the side of maintenance works.
- Check whether lubricating oil quantity is within a normal demand scope.
- Clean cooler
- Check oil filter, and replace if necessary.
- Check whether the thermostatic valve works normally and clean the temperature-sensing valve.
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

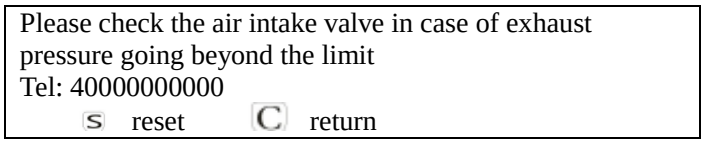
Fan overload



Turn off the main switch and make sure that the machine cannot be automatically started.

- Open enclosures on the side of maintenance works.
- Check whether the cooling fan is jammed and whether there is abnormal smell
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

Exhaust pressure going beyond the limit



Turn off the main switch and make sure that the machine cannot be automatically re-started.

- Open the ventilation valve to deflate the air compressor.
- Wait for many minutes until the engine oil falling gets stable and there is no accumulated pressure inside.
- Open enclosures on the side of maintenance works
- Repair the air intake valve.
- Repair failed controlling lines.
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

Phase sequence protection

Power supply and phase sequence protection Contact No.: 400-000-0000 C return S reset

Turn off the main switch and make sure that the machine cannot be automatically started

- Please check whether input power is normal
- Please exchange the two pieces of power lines on the input side
- Turn on the main power switch after eliminating the faults
- Check whether there is foreign matter inside the unit before opening

Please contact with our factory or directly contact the agency if any of the following faults

Blockage of oil filter

In case of blockage of oil filter, please replace the oil filter Tel: 1 23456789012 S reset C return

Pressure transmitter fault

Pressure sensor fault Currently collected AD 1234 Tel: 1 23456789012 S reset C return

Communication fault of VSD Compressors

Communication fault Check whether the lines get loose Tel: 123456789012 S reset C return

Temperature sensor fault

Temperature sensor fault Currently collected AD 1234 Tel: 4000 000 0000 S reset C return

No pressure fault in the system

If there is no pressure in the system, check the pressure sensor Tel: 123456789012 S reset C return

If the above display screen shows, the machine will automatically activate production and shut down
Be careful!

1.4 Fault record
The fault occurrence moment will be saved in the chip inside the controller
The following shows the recording screen of VSD Compressors

Fault inquiry	Pressure	0.70MPa
	Temperature	110℃
	Accumulated time	123,456h
	C return	▲ ▼ S

Fault inquiry	Current	123.4A
	Bus voltage	123.4V
	*** *** *** *****	
	C return	▲ ▼ S

Press ▶ to enter the previous fault recording page

P	0.70	Current	21.0
T	110	Bus voltage	512.0
Accumulated time		101245	▲ 1 ▼
**********			

Press ▲ and ▼ on this page to check the recent 5 faults

The following shows the recording screen of fixed speed compressors

Fault reference	Fault pressure	1.10
	Fault temperature	78
	Accumulated time of fault	110034
	C return	C S reset

Press ▼ to enter the previous fault recording page

Pressure	1.10	Accumulated time	▲
Temperature	78	110034	
Exhaust pressure goes beyond the limit		▼	
C return		Fault 1	

Press ▲ and ▼ on this page to check the recent 5 faults

1.5 Maintenance reminder

The following screen will show up if the equipment reaches the maintenance time limit

Please replace three filters and oil at this moment. Please timely maintain the equipment to prevent aging.

Maintenance time expires
Contact No.: 400-000-0000
C return

1.6 Data reference

Press S on the user parameter page to enter the data reference

The following shows VSD Compressors

Data reference	**Input**			
	Output			
	Communication		**12**	
	C return		▼ Next page	

Data reference	**Main machine setting**	**50.00**
	Fan setting	**25.00**
	Current ratio	**100%**
	C return	▼ ▲

Data reference	**Fault**	**0**
	Early warning	**0**
	1 2 3 4 5 6 7 8 9 0 1 2	
	C return	▼ ▲

Data reference	**Hardware version**	**1.00**
	Software version	**1.00**
	C **return**	▼ ▲

Data reference	**Pressure AD**	**765**
	Temperature AD	**1234**
	C **return**	▲ **previous page**

Input: Input state of system numerical magnitude. Output: Output state of system numerical magnitude. Communication: Able to check the current state.

Times of communications per second: Read times correctly from the vertier every second, and this parameter can reflect whether communication works normally

Main machine setting: Operation frequency of vertier after PID calculation of the system. Fan setting: Pre-set operation frequency of vertier of the fan after PID calculation of the system.

Current fault characters: Current fault occurred in the system. Please firstly convert the hexadecimal system to binary number before checking

●BIT_0 communication fault ●BIT_1 Exhaust pressure sensor fault ●BIT_3 Exhaust temperature sensor fault ●BIT_6 Variable-frequency fault

●BIT_7 Fan fault ●BIT_8 Blockage fault of oil filter ●BIT_9 Pressure going beyond limit fault ●BIT_A Temperature going beyond limit fault

●BIT_E system has no pressure fault ●BIT_F Test running time expires ●BIT_10 Fault of phase sequence

Current warning words: Current warning occurred in the system. Please firstly convert the hexadecimal system to binary system before checking

●BIT_0 fine division blockage fault ●BIT_1 Blockage fault of air filter ●BIT_2 Warning about test running time ●BIT_3 Maintenance time expires

●BIT_4 location of current going beyond limit ●BIT_5 Location of current going beyond limit ●BIT_6 Warning for exhaust temperature going beyond limit

Exhaust pressure AD: Unconverted pressure reading. Exhaust temperature AD: Unconverted temperature reading. Hardware version No.: Version No. of PCB plate

Software version No.: Software version No. Load current ratio: Load status value of the current main vertier = output current/rated current. No.: Equipment No.

The following shows fixed speed compressors

Data reference	**Input**					
	Output					
	Communication					
	C return					

Data reference I for fixed speed compressors

Data reference	**Current ratio**	**100%**
	Fault	**0**
	Early warning	**0**
	C return	

Data reference II for fixed speed compressors

Data reference	**Pressure AD**	**180**
	Temperature AD	**652**

	C **return**	

Data reference III for fixed speed compressors

Data reference	**Phase A of motor**	**0**
	Phase B of motor	**0**
	Phase C of motor	**0**
	C return	

Data reference IV for fixed speed compressors

Data reference	Phase A of motor	0
	Phase B of motor	0
	Phase C of motor	0
	C return	▲ ▼

Data reference V for fixed speed compressors

Data reference	Hardware version	1.00
	Software version	1.00
	2013-01-03. .	
	C return	▲ ▼

Data reference VI for fixed speed compressors

Input the input status of the corresponding system numerical magnitude.

Output the output status of the corresponding system numerical magnitude.

Communication corresponds from left to right [Communication receiving] [Communication sending]

Current ratio is the percentage between the present current and the rated current of the main machine

The fault is in the current fault status

Fault of BITO exhaust pressure sensor	Fault of BIT1 exhaust temperature sensor	BIT2 overload fault of main machine	BIT3 fan overload fault
BIT4 current imbalance fault of main machine	BIT5 current imbalance fault of fan	BIT6 main machine phase shortage fault	BIT7 fan phase shortage fault
BIT8 Fault of phase sequence	BIT9 pressure going beyond limit fault	BITA temperature going beyond limit fault	BITB oil filter blockage fault
BITC system has no pressure fault	BITD abnormal input voltage	BITF using time expires	

Early-warning is in the current early-warning state

BITO maintenance time expires BIT1 oil filter blockage fault BIT2 fine division blockage fault BIT3 early warning for exhaust temperature going beyond limit BIT4 warning for using time

Pressure AD is the actual AD value of pressure read by the system

Temperature AD is the actual AD value of temperature read by the system

Phase A, Phase B and Phase C of the motor are actual AD values of the main machine current read by the system

Phase A, Phase B and Phase C of the fan are actual AD values of the fan current read by the system

Hardware version No.: Version No. of PCB plate

Software version No.: Software version No.

The next row describes equipment number, and can be set after activating the manufacturer's password. Production number can involve figures and letters

II. Controller function and technical parameters

2.1 Working environment: -20℃- + 60℃

2.2 Switching quantity Input of switching quantity of Line 3 and output of switching quantity of Line 5 relay

2.3 Analog quantity Input of PT1000 temperature of Line 1, input of 4-20mA of Line 1 and inspection to AC current sensor of Line 2

2.4 Phase sequence detection circuits: Able to detect phase dislocation and phase shortage

2.5 Controller power supply: AC16-28V, 15VA

2.6 Display range

2.6.1 Exhaust temperature: -100-200℃, precision of +-1℃

2.6.2 Working time: 0-999999h

2.6.3 Pressure detection range: 0−(1.60−2.40) MPa. Precision: 0.01 MPa

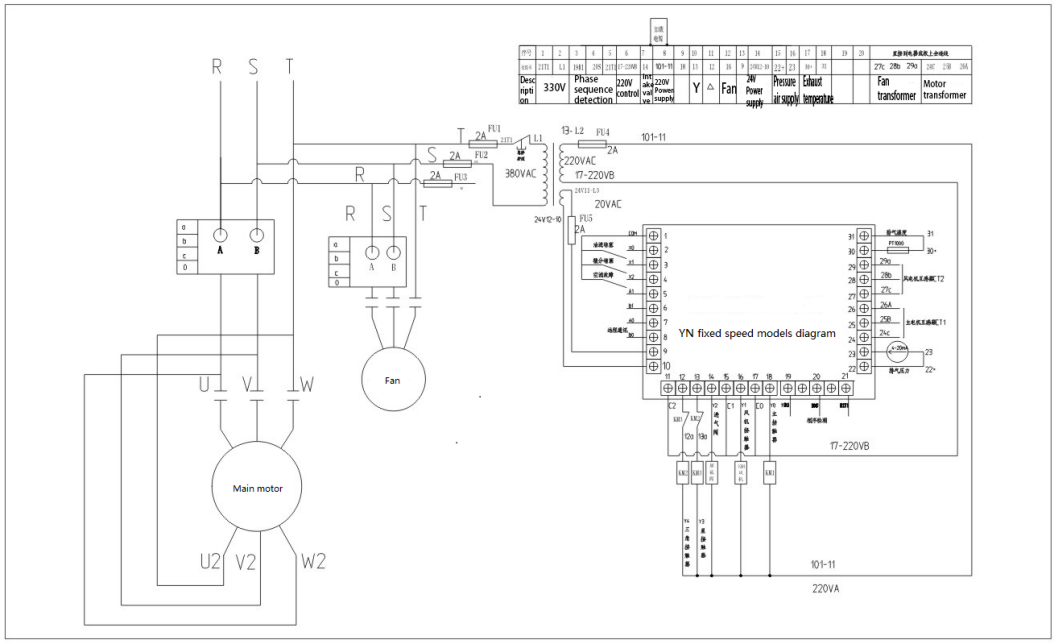
2.7 Temperature protection If the detected actual temperature is higher than the pre-set temperature, action time is < = 1S

2.8 Relay contact capacity: 250V, 5A; Life cycle of contacts is 500,000 times

2.9 RS485 interface: Used for joint control or communication with computer

III. Electrical principle diagram

YN860, YN880 Fixed Speed Models Electrical Diagram



YN860, YN880 VSD Models Electrical Diagram